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09/435,448	11/22/1999	YASUYOSHI YAMADA	Q56857	5236

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EXAMINER

GRAYBILL, DAVID E

ART UNIT PAPER NUMBER

2827

DATE MAILED: 02/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/435,448

Applicant(s)

YAMADA, YASUYOSHI

Examiner

David E Graybill

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Applicant's petition to withdraw the finality of the May 20, 2003 Office action under 37 C.F.R. j 1.81 has been granted. Therefore, the finality of that action is withdrawn, the amendment filed 8-20-3 is entered, and claims 1-22 are herein examined on the merits.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 3 and 9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claims 3 and 9, the limitation that the group of electrodes includes an electrode that is not connected to the circuit is not enabled because it is incompatible with the claims 1 and 7 limitation that the electronic part comprises the circuit and the electrodes. Specifically, the claims 1 and 7 limitation requires that the circuit and the electrodes are at least physically connected.

In claims 3 and 9, the limitation that the electrode is not connected to the circuit is unenabled because the limitation is incompatible with the claims 1 and 7 limitation that the electrodes are connected to the circuit.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3-13, 15-18 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following lack sufficient antecedent basis:

Claims 3-6 and 9-13, "said group";

Claim 7, "said electrodes provided for said electronic part";

Claims 9 and 10, "said integrated electrodes";

Claims 13 and 15, "the rearmost surface";

Claim 16, "said first solder bump";

Claim 17, "said solder bumps";

Claims 17 and 18, "said electrodes arranged for solder bumps";

Claim 20, "each of said first electrodes and second electrodes," and, "said rear surface."

In claims 3 and 9, the limitation that the group of electrodes includes an electrode that is not connected to the circuit is incompatible with the claims 1 and 7 limitation that the electronic part comprises the circuit and the electrodes. Specifically, the claims 1 and 7 limitation requires that the circuit and the electrodes are at least physically connected.

In claims 3 and 9, the limitation that the electrode is not connected to the circuit is indefinite because the limitation is incompatible with the claims 1 and 7 limitation that the electrodes are connected to the circuit.

Claims 8-12, 16-18 and 20 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. To further clarify, claims 8-12, 16-18 and 20 refer only to the back electrode electronic part element of claim 7, but claim 7 comprises additional limiting elements not referred to by claims 8-12, 16-18 and 20.

In the rejections infra, reference labels are generally recited only for the first recitation of identical elements.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the

international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-8 and 10-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Smith (6202298).

At column 3, lines 46-51; column 4, line 64-66; column 5, lines 14-17 and 51-54; column 7, lines 46-49 and 57-64; column 9, lines 42-55; column 10, lines 8-30; column 11, lines 21-56; column 17, lines 14, 49 and 64; column 18, lines 58-62; column 19, line 59 to column 20, line 4; column 24, line 61 to column 25, line 26; column 29, line 40 to column 30, line 6; column 30, line 38 to column 31, line 2; column 32, lines 13-23 and 54-59; column 33, lines 46-50; and column 35, lines 54-57, Smith teaches an electronic assembly comprising: a back electrode electronic part comprising: a main body 1524 including a circuit "circuit element," and electrodes 1528/905 arranged on a back surface portion 1526 of said electronic part and connected to said circuit, wherein said electrodes are arranged into groups of electrodes (column 24, line 61 to column 25, line 3) at portions of the electrode arrangement; said groups of electrodes includes said

electrodes having a substantially same potential level when said circuit operates, said electronic assembly further comprising: a printed circuit board 1512 having substrate electrodes 1519/905 corresponding to said electrodes provided for said electronic part, wherein one of said substrate electrodes as a first substrate electrode 1519/905 is provided for each of said groups of electrodes, and said substrate electrodes as second substrate electrodes 1519/905 other than said first substrate electrodes are provided for said electrodes of said electronic part other than in said groups of electrodes; and solder bumps 1550a/914 including first solder bumps 1550a/914 connected with said groups of electrodes and said first substrate electrodes and second solder bumps 1550a/914 connected with said second substrate electrodes and said electrodes of said electronic part other than said groups of electrodes, wherein said electrodes of said electronic part are arranged in a matrix, and said groups of electrodes are corner portions (Figures 2 and 3, and column 24, line 61 to column 25, line 3), wherein one of said integrated electrodes of said group is a signal electrode, wherein one of said electrodes of said group is a ground potential electrode, wherein one of said electrodes of said group is a power supply potential electrode, wherein said groups of electrodes are directly connected to said first solder bump, wherein said electrodes arranged for solder bumps protrude from said electronic part so as to support said solder bumps, wherein said electrodes arranged for solder

bumps are provided on the rearmost surface of said electronic part, wherein each of said first electrodes and second electrode are arranged in a matrix on said rear surface of said electronic part.

A back electrode electronic part comprising: a main body including a circuit; and electrodes arranged for solder bumps on a back surface portion of said electronic part and connected to said circuit, wherein said electrodes are arranged into groups of electrodes at portions of the electrode arrangement; said groups of electrodes are provided for a single first solder bump 1550a/914 which is larger than second solder bumps for said electrodes arranged other than in said groups of electrodes; and said groups of electrodes includes electrodes having a substantially same potential level when said circuit operates.

A back electrode electronic part comprising: at least two first electrodes 905 positioned on a rear surface of said electronic part so as to be connected to a first solder bump 914; at least one second electrode 904 positioned on a rear surface of said electronic so as to be connected to a second solder bump 912; wherein said first solder bump has a larger lateral cross section than said second solder bump.

A back electrode electronic part comprising: a main body including a circuit; and electrodes arranged for solder bumps and supported on a back surface portion of said electronic part and connected to said circuit; wherein

said electrodes are arranged into groups of electrodes at portions of the electrode arrangement; at least one of said groups of electrodes is connected to a first solder bump which is larger than second solder bumps connected to said electrodes arranged other than in said groups of electrodes; and said groups of electrodes include electrodes having a substantially same potential level when said circuit operates.

A back electrode electronic part comprising: at least two first electrodes supported on a rear surface of said electronic part and connected to a first solder bump; at least one second electrode supported on a rear surface of said electronic part and connected to a second solder bump; wherein said first solder bump has a larger lateral cross section than said second solder bump.

To further clarify the teaching that said groups of electrodes include electrodes having a substantially same potential level when said circuit operates, this limitation is an inherent property of the group of electrodes of Smith because they are electrically interconnected by the bump. In any case, the limitation, "electrodes having a substantially same potential level when said circuit operates," is a statement of intended function which does not result in a structural difference between the claimed product and the product of Smith. Further, because the electrodes of Smith are inherently capable of functioning as intended, the statement of intended function does

not patentably distinguish the claimed electrodes from the electrodes of Smith. It is well established that the manner in which a product operates is not germane to the issue of patentability of the product; *Ex parte Wikdahl* 10 USPQ 2d 1546, 1548 (BPAI 1989); *Ex parte McCullough* 7 USPQ 2d 1889, 1891 (BPAI 1988); *In re Finsterwalder* 168 USPQ 530 (CCPA 1971); *In re Casey* 152 USPQ 235, 238 (CCPA 1967). And, claims directed to product must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531 (CCPA 1959). "Product claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

Also, although Smith teaches wherein one of said integrated electrodes of said group is a signal electrode, wherein one of said electrodes of said group is a ground potential electrode, and wherein one of said electrodes of said group is a power supply potential electrode, it is noted that the intended use of the electrodes as signal, ground and power electrodes does not result in a structural difference between the claimed electrodes and the electrode of Smith. Further, because the electrode of Smith is inherently capable of being used for the intended use, the statement of intended use does not patentably distinguish the claimed electrodes from the electrode of Smith.

Claims 3 and 9 are is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith as applied to claims 1, 2, 4-8 and 10-22, and further in combination with Kaneshiro (JP10-56093).

Although Smith does not appear to explicitly teach that said electrodes includes a non-contact electrode which is not connected to said circuit, and that one of said integrated electrodes of said group is a non-contact electrode which is not connected to said circuit, in the figures, and English translation and abstract, Kaneshiro teaches one of integrated electrodes 10 of a group is a non-contact electrode (associated with "non contact electrode (N)") which is not connected to a circuit.

Moreover, it would have been obvious combine the non-contact electrode of Kaneshiro with the product of Smith because, as taught by Kaneshiro, it would improve connection strength and reliability and facilitate production of a BGA device ("double with the specification of a BGA type semiconductor device").

Claims 1, 2, 4-6, 13-15, 19, 21 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Barrow (6118182).

At column 1, lines 5-21; and column 2, line 8 to column 4, line 9, Barrow teaches:

A back electrode electronic part comprising: a main body 12 including a circuit; and electrodes 18 arranged for solder bumps 20, 26 on a back

surface portion of said electronic part and connected to said circuit, wherein said electrodes are arranged into groups of electrodes "adjoining pads" at portions of the electrode arrangement; said groups of electrodes are provided for a single first solder bump "robust solder joints" 26 which is larger than second solder bumps 20,26 for said electrodes arranged other than in said groups of electrodes; and said groups of electrodes includes electrodes having a substantially same potential level when said circuit operates, wherein said electrodes are arranged in a matrix, and said groups of electrodes are corner portions, wherein one of said electrodes of said group is a signal electrode, wherein one of said electrodes of said group is a ground potential electrode, wherein one of said electrodes of said group is a power supply potential electrode, wherein said group of electrodes are directly connected to said first solder bump, wherein said electrodes arranged for solder bumps protrude from said electronic part so as to support said solder bumps, wherein said electrodes arranged for solder bumps are provided on the rearmost surface of said electronic part.

A back electrode electronic part comprising: at least two first electrodes 18 positioned on a rear surface of said electronic part so as to be connected to a first solder bump; at least one second electrode 18 positioned on a rear surface of said electronic so as to be connected to a

second solder bump 20, 26; wherein said first solder bump has a larger lateral cross section than said second solder bump.

A back electrode electronic part comprising: a main body including a circuit; and electrodes arranged for solder bumps and supported on a back surface portion of said electronic part and connected to said circuit; wherein said electrodes are arranged into groups of electrodes at portions of the electrode arrangement; at least one of said groups of electrodes is connected to a first solder bump which is larger than second solder bumps connected to said electrodes arranged other than in said groups of electrodes; and said groups of electrodes include electrodes having a substantially same potential level when said circuit operates.

A back electrode electronic part comprising: at least two first electrodes supported on a rear surface of said electronic part and connected to a first solder bump; at least one second electrode supported on a rear surface of said electronic part and connected to a second solder bump; wherein said first solder bump has a larger lateral cross section than said second solder bump.

Further, the claim 1 limitations, "arranged for solder bumps," and, "for a single first solder bump which is larger than second solder bumps for said electrodes arranged other than in said groups of electrodes," the claim 13, limitation, "so as to support said solder bumps," and the claim 19 limitation,

"so as to be connected to a second solder bump; wherein said first solder bump has a larger lateral cross section than said second solder bump," are statements of intended use of the electrodes which do not result in a structural difference between the claimed electrodes and the electrodes of Barrow. Further, because the electrodes of Barrow have the same structure as the claimed electrodes, they are inherently capable of being used for the intended uses, and the statements of intended use do not patentably distinguish the claimed electrodes from the electrodes of Barrow.

In any case, Barrow explicitly teaches the statements of intended use. In particular, to further clarify the teaching of a single first solder bump "robust solder joints" 26 which is larger than second solder bumps 20,26, and wherein said first solder bump has a larger lateral cross section than said second solder bump, it is noted that Barrow teaches that the first bump comprises two second bumps; therefore, it is larger than the second bumps. In addition, Barrow teaches that the "pad [electrode] has a width that is less than a length," and that the bumps, "typically reflows into the rectangular shape of the contact pad"; hence, Barrow teaches that the first bump has a width that is less than a length. Similarly, Barrow teaches that the first bump has "a relatively long length," and, "additional length." Therefore, the first bump has a larger lengthwise lateral cross section than the widthwise

lateral cross section of the second bump. Indeed, the drawings and the totality of the disclosure are drawn to these dimensional limitations.

To further clarify the teaching that said groups of electrodes include electrodes having a substantially same potential level when said circuit operates, this limitation is an inherent property of the group of electrodes of Barrow because they are electrically interconnected by the first bump. In any case, the limitation, "electrodes having a substantially same potential level when said circuit operates," is a statement of intended function which does not result in a structural difference between the claimed electrodes and the electrodes of Barrow. Further, because the electrodes of Barrow are inherently capable of functioning as intended, the statement of intended function does not patentably distinguish the claimed electrodes from the electrodes of Barrow.

Also, although Barrow explicitly teaches wherein one of said electrodes of said group is a ground potential electrode, and wherein one of said electrodes of said group is a power supply potential electrode, the intended use of the electrodes as ground and power electrodes does not result in a structural difference between the claimed electrodes and the electrode of Barrow. Further, because the electrode of Barrow is inherently capable of being used for the intended use, the statement of intended use does not patentably distinguish the claimed electrodes from the electrode of Barrow.

Similarly, although Barrow does not appear to explicitly teach wherein one of said integrated electrodes of said group is a signal electrode, this intended use of the electrodes does not result in a structural difference between the claimed electrodes and the electrode of Barrow. Further, because the electrode of Barrow is inherently capable of being used for the intended use, the statement of intended use does not patentably distinguish the claimed electrodes from the electrode of Barrow.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barrow as applied to claim 1, and further in combination with Kaneshiro (JP10-56093).

Although Barrow does not appear to explicitly teach that the group of electrodes includes a non-contact electrode which is not connected to said circuit, in the figures, and English translation and abstract, Kaneshiro teaches one of integrated electrodes 10 of a group " is a non-contact electrode (associated with "non contact electrode (N)") which is not connected to a circuit.

Moreover, it would have been obvious combine the non-contact electrode of Kaneshiro with the product of Smith because, as taught by Kaneshiro, it would improve connection strength and reliability and facilitate production of a BGA device ("double with the specification of a BGA type semiconductor device").

Claims 7, 8, 10-12, 16-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barrow as applied to claims 1, 2, 4-6, 13-15, 19, 21 and 22, and further in combination with Dockerty (5796169).

As cited supra, Barrow teaches an electronic assembly comprising: a back electrode electronic part comprising: a main body including a circuit and electrodes arranged on a back surface portion of said electronic part and connected to said circuit, wherein said electrodes are arranged into groups of electrodes at portions of the electrode arrangement; said groups of electrodes includes said electrodes having a substantially same potential level when said circuit operates; said electronic assembly further comprising: a printed circuit board 28 having substrate locations (illustrated in Figure 4, not labeled) corresponding to said electrodes provided for said electronic part, wherein one of said substrate locations as a first substrate location is provided for each of said groups of electrodes, and said substrate locations as second substrate locations other than said first substrate locations are provided for said electrodes of said electronic part other than in said groups of electrodes; and solder bumps including first solder bumps connected with said groups of electrodes and said first substrate locations and second solder bumps connected with said second substrate locations and said electrodes of said electronic part other than said groups of electrodes, wherein said electrodes of said electronic part are arranged in a

matrix, and said groups of electrodes are corner portions, wherein one of said integrated electrodes of said group is a signal electrode, wherein one of said electrodes of said group is a ground potential electrode, wherein one of said electrodes of said group is a power supply potential electrode, wherein said groups of electrodes are directly connected to said first solder bump, wherein said electrodes arranged for solder bumps protrude from said electronic part so as to support said solder bumps, wherein said electrodes arranged for solder bumps are provided on the rearmost surface of said electronic part, wherein each of said first electrodes and second electrode are arranged in a matrix on said rear surface of said electronic part.

However, Barrow does not appear to explicitly teach substrate electrodes.

Nevertheless, at column 2, lines 27-44; column 5, lines 38-67; and column 6, line 59 to column 7, line 11, Dockerty teaches substrate electrodes 34. In addition, it would have been obvious to provide the electrodes of Dockerty at the locations of Barrow because it would facilitate bump connection.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barrow as applied to claim 7, and further in combination with Kaneshiro (JP10-56093).

Although Barrow does not appear to explicitly teach that one of said integrated electrodes of said group is a non-contact electrode which is not connected to said circuit, in the figures, and English translation and abstract, Kaneshiro teaches one of integrated electrodes 10 of a group " is a non-contact electrode (associated with "non contact electrode (N)") which is not connected to a circuit.

Moreover, it would have been obvious combine the non-contact electrode of Kaneshiro with the product of Barrow because, as taught by Kaneshiro, it would improve connection strength and reliability and facilitate production of a BGA device ("double with the specification of a BGA type semiconductor device").

Claims 1, 7, 14, 15 and 17-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Kaneshiro (JP10-56093).

In the English abstracts, translation and figures, Kaneshiro teaches a back electrode electronic part comprising: a main body 2 including a circuit 5; and electrodes 10 arranged for solder bumps 9 on a back surface portion of said electronic part and connected to said circuit; wherein said electrodes are arranged in groups of electrodes at portions of the electrode arrangement; and said groups of electrodes are provided for a single first solder bump which is larger than second solder bumps for said electrodes arranged other than in said groups of electrodes, and said groups of

electrodes having a substantially same potential level (ground/voltage/non-contact potential level) when said circuit operates; wherein said electrodes arranged for solder bumps protrude from said electronic part so as to support said solder bumps, wherein said electrodes arranged for solder bumps are provided on the rearmost surface of said electronic part, and an electronic assembly comprising: a back electrode electronic part comprising: a main body including a circuit, and electrodes arranged on a back surface portion of said electronic part and connected to said circuit, wherein said electrodes are arranged into groups of electrodes at portions of the electrode arrangement; said groups of electrodes includes said electrodes having a substantially same potential level when said circuit operates; said electronic assembly further comprising; a printed circuit board 20 having substrate electrodes 21 corresponding to said electrodes provided for said electronic part, wherein one of said substrate electrodes as a first substrate electrode is provided for each of said groups of electrodes, and said substrate electrodes as second substrate electrodes other than said first substrate electrodes are provided for said electrodes of said electronic part other than in said groups of electrodes, and solder bumps 9 including first solder bumps connected with said groups of electrodes and said first substrate electrodes and second solder bumps

connected with said second substrate electrodes and said electrodes of said electronic part other than said groups of electrodes, wherein said electrodes arranged for solder bumps protrude from said electronic part so as to support said solder bumps, wherein said electrodes arranged for solder bumps are provided on the rearmost surface of said electronic part, and a back electrode electronic part comprising: at least two first electrodes 10 positioned on a rear surface of said electronic part so as to be connected to a first solder bump, at least one second electrode 10 positioned on a rear surface of said electronic part so as to be connected to a second solder bump, wherein said first solder bump has a larger lateral cross section than said second solder bump, wherein each of said first electrodes and second electrode are arranged in a matrix on said rear surface of said electronic part.

To further clarify the teaching of the limitations, "for a single first solder bump which is larger than second solder bumps for said electrodes arranged other than in said groups of electrodes," and, "so as to be connected to a first solder bump, wherein said first solder bump has a larger lateral cross section than said second solder bump," although not explicitly taught by Kaneshiro, it is noted that these limitations are statements of intended use of the electrodes which does not result in a structural difference between the claimed electrodes and the electrodes of

Kaneshiro. Further, because the electrodes of Kaneshiro have the same structure as the claimed electrodes, they are inherently capable of being used for the intended uses, and the statements of intended use do not patentably distinguish the claimed electrodes from the electrodes of Kaneshiro.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneshiro as applied to claim 7, and further in combination with Barrow (6118182).

Kaneshiro does not appear to explicitly teach wherein the group of electrodes are directly connected to the first solder bump.

Nonetheless, as cited *supra*, Barrow teaches wherein a group of electrodes 18 are directly connected to a first solder bump 26. Moreover, it would have been obvious to combine the product of Barrow with the product of Kaneshiro because it would reduce electronic part strain and increase the life of the solder bump.

Claims 1, 13-15, 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakuyama (6018462).

At column 1, lines 60-62, and column 2, line 31 to column 4, line 4, Sakuyama teaches a back electrode electronic part comprising: a main body 1 including a circuit 5; and electrodes 4a-4d arranged for solder bumps 9 on a back surface portion of said electronic part and connected to said circuit;

wherein said electrodes are arranged in groups of electrodes at portions of the electrode arrangement; and said groups of electrodes are provided for a single first solder bump which is larger than second solder bumps for said electrodes arranged other than in said groups of electrodes, and said groups of electrodes having a substantially same potential level when said circuit operates; wherein said group of electrodes are directly connected to said first solder bump, wherein said electrodes arranged for solder bumps protrude from said electronic part so as to support said solder bumps, wherein said electrodes arranged for solder bumps are provided on the rearmost surface of said electronic part, and a back electrode electronic part comprising: at least two first electrodes 4a, 4b positioned on a rear surface of said electronic part so as to be connected to a first solder bump, at least one second electrode 4a positioned on a rear surface of said electronic part so as to be connected to a second solder bump, wherein said first solder bump has a larger lateral cross section than said second solder bump, wherein each of said first electrodes and second electrode are arranged in a matrix on said rear surface of said electronic part.

To further clarify the teaching of the limitations, "for a single first solder bump which is larger than second solder bumps for said electrodes arranged other than in said groups of electrodes," and, "so as to be connected to a first solder bump, wherein said first solder bump has a

larger lateral cross section than said second solder bump," it is noted that these limitations are statements of intended use of the electrodes which does not result in a structural difference between the claimed electrodes and the electrodes of Sakuyama. Further, because the electrodes of Sakuyama have the same structure as the claimed electrodes, they are inherently capable of being used for the intended uses, and the statements of intended use do not patentably distinguish the claimed electrodes from the electrodes of Sakuyama.

Claims 1 and 3-6 are rejected under 35 U.S.C. 102(e) as anticipated by Geffken (5883435) or, in the alternative, under 35 U.S.C. 103(a) as obvious over the combination of Geffken (5883435) and Dockerty (5796169).

At column 1, line 54-65; column 2, line 18 to column 4, lines 11, 31-35 and 51-54; column 5, lines 13-42; column 6, lines 31-33; column 7, line 31 to column 8, line 11; and column 8, lines 21-37, Geffken teaches a back electrode electronic part comprising: a main body 102 including a circuit 108, 110, 112; and electrodes 124, 126, 128 arranged for solder bumps 172, 174 on a back surface portion of said electronic part and connected to said circuit; wherein said electrodes are arranged in groups of electrodes 126, 128 at portions of the electrode arrangement; and said groups of electrodes are provided for a single first solder bump 174 which is larger

than second solder bumps 170, 172 for said electrodes arranged other than in said groups of electrodes, and said groups of electrodes having a substantially same potential level when said circuit operates, wherein said electrodes includes a non-contact electrode 172 which is not connected to said circuit, wherein one of said electrodes of said group is a signal electrode, wherein one of said electrodes of said group is a ground potential electrode, wherein one of said electrodes of said group is a power supply potential electrode.

To further clarify the teaching that the electrodes are arranged on a back surface portion of the electronic part, Geffken discloses that the electrodes are arranged in close proximity with every portion of the electronic part; in a direction or location with respect to every portion of the electronic part; and in contact with (at least indirectly) every portion of the electronic part; therefore, at least for these reasons, Geffken teaches that the electrodes are arranged on the back surface portion. See *May v. Carriage Inc.*, U.S. District Court Northern District of Indiana, 7 USPQ2d 1593, *Bocciarelli v. Huffman* (CCPA), 109 USPQ 385, and *Inverness Medical Switzerland GmbH v. Warner Lambert Co.*, U.S. Court of Appeals Federal Circuit, 64 USPQ2D 1933.

Although Geffken does not appear to explicitly teach that said groups of electrodes are provided for a single first solder bump 174 which is larger

than second solder bumps 170, 172 for said electrodes arranged other than in said groups of electrodes, it is noted that this limitation is a statement of intended use of the electrodes 124, 126 and 128 which does not result in a structural difference between the claimed electrodes and the electrodes of Geffken. Further, because the electrodes of Geffken have the same structure as the claimed electrodes, they are inherently capable of being used for the intended use, and the statement of intended use does not patentably distinguish the claimed electrodes from the electrodes of Geffken.

To further clarify the teaching wherein the group of electrodes includes electrodes having a substantially same potential level when the circuit operates, it is noted that this limitation is an inherent property of the group of electrodes of Geffken because they are electrically interconnected by the bump. In any case, the limitation, "electrodes having a substantially same potential level when said circuit operates," is a statement of intended function which does not result in a structural difference between the claimed electrodes and the electrodes of Geffken. Further, because the electrodes of Geffken are inherently capable of functioning as intended, the statement of intended function does not patentably distinguish the claimed electrodes from the electrodes of Geffken.

To further clarify the teachings wherein one of the electrodes of the group is a signal electrode, a ground potential electrode, and a power supply

potential electrode, it is noted that the intended use of the electrode as a signal, ground and power electrode does not result in a structural difference between the claimed electrode and the electrode of Geffken. Further, because the electrode of Geffken is inherently capable of being used as intended, the statement of intended use does not patentably distinguish the claimed electrode from the electrode of Geffken.

Because Geffken does not appear to teach literally that the first solder bump is larger than the second solder bumps, one of the electrodes of the group is a signal electrode, one of the electrodes of the group is a ground potential electrode, and one of the electrodes of the group is a power supply potential electrode, the claims are rejected in the alternative over the combination of Geffken and Dockerty.

In particular, at column 3, lines 1-5, column 3, lines 16-30 and 48-61, column 4, lines 23-26, column 4, line 35 to column 5, line 23, column 5, lines 37-47, and column 6, lines 17-31 and 38-40, Dockerty teaches that a first solder bump 16 is larger than second solder bumps 11, and an electrode 15 is a signal electrode, a ground potential electrode, and a power supply potential electrode. Moreover, it would have been obvious to combine the product of Dockerty with the product of Geffken because it would provide structural support, and signal, ground and power connections.

Claims 2 and 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Geffken (5883435) and Dockerty (5796169).

Geffken is applied as it is applied to claim 1 supra.

In addition, as cited supra, Geffken teaches the following:

Said electrodes are arranged in a matrix "array".

An electronic assembly comprising: a back electrode electronic part comprising: a main body including a circuit, and electrodes arranged on a back surface portion of said electronic part and connected to said circuit, wherein said electrodes are arranged into groups of electrodes at portions of the electrode arrangement; said groups of electrodes includes said electrodes having a substantially same potential level when said circuit operates, wherein said electrodes of said electronic part are arranged in a matrix, wherein one of said integrated electrodes is a non-contact electrode which is not connected to said circuit.

However, Geffken does not appear to explicitly teach a printed circuit board having substrate electrodes corresponding to said electrodes provided for said electronic part, wherein one of said substrate electrodes as a first substrate electrode is provided for each said groups of electrodes, and said substrate electrodes as second substrate electrodes other than said first substrate electrodes are provided for said electrodes of said electronic part

other than in said groups of electrodes, and solder bumps including first solder bumps connected with said groups of electrodes and said first substrate electrodes and second solder bumps connected with said second substrate electrodes and said electrodes of said electronic part other than said groups of electrodes, and said groups of electrodes are corner portions.

Nonetheless, as cited *supra*, Dockerty teaches a printed circuit board 1 having substrate electrodes 34 corresponding to electrodes provided for an electronic part 3, wherein one of the substrate electrodes as a first substrate electrode is provided for electrode 15, and substrate electrodes as second substrate electrodes other than the first substrate electrodes are provided for electrodes 4 of the electronic part other than the electrodes 15, and solder bumps including first solder bumps 16 connected with the electrodes 15 and the first substrate electrodes and second solder bumps 11 connected with the second substrate electrodes and the electrodes of the electronic part other than the electrodes 15, and the electrodes 15 are corner portions. In addition, it would have been obvious to combine the product of Dockerty with the product of Geffken because it would provide structural support.

Also, Geffken and Dockerty are applied to the rejection of claims 10-12 for the same reasons the combination is applied to the rejection of claims 4-6 *supra*.

Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Geffken or Geffken and Dockerty as applied to claim 1, and further in combination with Barrow (6118182).

The references applied to claim 1 do not appear to explicitly teach wherein said group of electrodes are directly connected to said first solder bump, wherein said electrodes arranged for solder bumps protrude from said electronic part so as to support said solder bumps, and wherein said electrodes arranged for solder bumps are provided on the rearmost surface of said electronic part.

Nevertheless, as cited supra, Barrow teaches these limitations.

Furthermore, it would have been obvious to combine the product of Barrow with the product of the applied prior art, because it would reduce electronic part strain and increase solder bump life.

Claims 8-12, 16-18 and 20 are rejected under 35 U.S.C. 102(a) as being anticipated by Kaneshiro (JP10-56093).

The following rejection is applicable when claims 8-12 and 16-18 are interpreted as incorporating by reference only the back electronic part element of claim 7.

As cited supra, Kaneshiro teaches a back electrode electronic part comprising: a main body 2 including a circuit 5, and electrodes 10 arranged on a back surface portion of said electronic part and connected to said

circuit, wherein said electrodes are arranged into groups of electrodes at portions of the electrode arrangement; said groups of electrodes includes said electrodes having a substantially same potential level (ground/voltage/non-contact potential level) when said circuit operates, wherein said electrodes of said electronic part are arranged in a matrix, and said groups of electrodes are corner portions, wherein one of said integrated electrodes of said group is a non-contact electrode (associated with "non contact electrode (N)") which is not connected to said circuit, wherein one of said integrated electrodes of said group is a signal electrode (associated with the "electrode for signals for I/O"), wherein one of said electrodes of said group is a ground potential electrode (associated with "grand electrode (G)"), wherein one of said electrodes of said group is a power supply potential electrode (associated with "power supply electrode (V)"), wherein said groups of electrodes are directly connected to said first solder bump 9, wherein said electrodes 10 arranged for solder bumps 9 protrude from said electronic part so as to support said solder bumps, wherein said electrodes 10 arranged for solder bumps are provided on the rearmost surface of said electronic part, wherein each of said first electrodes 10 and second electrode 10 are arranged in a matrix on said rear surface of said electronic part.

Applicant's amendment and remarks filed 8-20-3 have been fully considered, are addressed by the rejections *supra*, and are further addressed *infra*.

Applicant's argument that Sakuyama is not available as prior art under 35 U.S.C. 103(a) is deemed persuasive. Therefore, the rejection of claims 13-18 under 35 U.S.C. 103(a) over Sakuyama has been withdrawn.

Also, applicant appears to contend that the rejection of claims 1, 7, 14, 15 and 17-20 over Kaneshiro is improper because, "the Examiner has interpreted 'solder bumps' as required structural elements of independent claims 1 and 7 throughout the prosecution of the instant Application, and cannot now change his interpretation to 'fit' newly applied references." To support this contention, applicant quotes several portions of previous Office actions.

This contention is respectfully traversed because solder bumps have not been interpreted as required structural elements of independent claims 1 and 7 throughout the prosecution of the instant application, and applicant's several citations do not support this contention. To this end, it is noted that an intended use limitation is anticipated by a prior art teaching of the use as intended. Therefore, in the instant record, any application of the prior art for a teaching of the use of the solder bumps as intended, anticipates the

claimed intended use of the solder bumps, and does not engender applicant's suggested prosecution history disclaimer or estoppel.

Relatedly, applicant argues, "the claimed 'part' or 'assembly' is not *used* to achieve these 'solder bumps,' and does not *provide* 'solder bumps' in its operation."

This argument is respectfully deemed unpersuasive because the claims are not so limited, and Kaneshiro is not applied to the rejection for a teaching that the claimed part or assembly is used to achieve these solder bumps and to provide solder bumps in its operation.

Applicant also alleges that Geffken does not teach electrodes arranged for solder bumps on a back surface portion of said electronic part, because the electrodes, "can only reasonably be construed as internal components of the circuit structure disclosed in Geffken. Such internal components cannot be arranged 'on a back surface portion' of the electronic part."

This allegation is respectfully deemed unpersuasive because applicant has not cited the disclosure of Geffken by which the electrodes can only reasonably be construed as internal components of the circuit structure; hence, the reasonableness of the construe cannot be evaluated. In particular, applicant has not identified the teaching of Geffken of a "circuit structure," or the reason that the electrodes can only be construed as internal components of the circuit structure. Moreover, applicant's statement that

such internal components cannot be arranged on a back surface portion of the electronic part is unpersuasive because it is mere allegation without a showing of facts or other elaboration.

Applicant also appears to argue that Geffken does not teach electrodes 126, 128. This apparent argument is respectfully traversed because Geffken teaches electrical conducting elements 127, 128 that emit, or collect electrons, or ions, or control their movement by means of an electric field on them; therefore, Geffken teaches electrodes as defined in the Manual of Classification, Class 257, Glossary.

In addition, applicant alleges, "It seems clear that solder bumps cannot be connected to an electrode unless it is exposed on the rear surface of the electronic part," and, "the Examiner's reading of claim 1 to include internal components of the circuit structure of Geffken is inapplicable, as an internal arrangement would preclude the ability of the electrodes to be "arranged for solder bumps."

These allegations are respectfully deemed unpersuasive and are traversed because the rejection of claim 1 does not rely on a reading of claim 1 to include internal components of a circuit structure of Geffken. Moreover, applicants allegations that solder bumps cannot be connected to an electrode unless it is exposed on the rear surface of the electronic part, and that an internal arrangement would preclude the ability of the electrodes

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to be arranged for solder bumps, are mere conjecture unsupported by proof or a showing of facts.

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to Group 2800 Customer Service whose telephone number is 703-306-3329.

Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947, or after about 02/05/04, (571) 272-1930. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is (703) 872-9306.



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Art Unit 2827

D.G.
24-Jan-04